

LOGSHEET FOR FIELD CHANGES TO CONTROLLED DOCUMENTS

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description Of Change(s)	Responsible Manager Approval	ES&H Approval	Biological Engineering Approval	Quality Assurance Approval	Completion Of ADM 2.01 Checklist	Completion Of SRS/ISQD Checklist
1	6-4-98	RF/RMRS-97-010	Final Site Specific Health and Safety Plan for the Source Removal at Trench 1 IHSS 108	Section TOC Page viii	Revised Table of Contents	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section TOC Page viii List of Appendices	Deleted Appendix D. Will put into the IWCP	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 3.2 Page 10 Figure 3.3	Revised map to show new west gate and added numbers to gates	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 3.2 Page 11 Figure 3.4	Revised map to show new configuration of the Sampling and Inerting Pad and the Contamination Area inside the main body of the temporary structure	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 4.1.1 Page 16	Changed "steel" to "plastic" in description of containment pan	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 4.2.1 Page 17	Deleted reference to Appendix D	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 4.7 Page 25	Deleted reference to Appendix D	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 5.4.1 Page 48	Added "the north side of the trench will be barricaded and posted during excavator operations to protect personnel from the swing path of excavator counterweight"	WLS	DF	W	W	NA	NA
1	6-4-98	RF/RMRS-97-010		Section 5.4.8 Page 51	Added "if possible" prior to the sixth bullet	WLS	DF	W	W	NA	NA

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description Of Change(s)	Responsible Manager Approved	ES&H Approval	Radiological Engineering Approval	Quality Assurance Approval	Completion Of ADM 2.01 Checklist	Completion Of SESUSQP Checklist
1	6-4-98	RF/RMRS-97-010	Final Site Specific Health and Safety Plan for the Source Removal at Trench 1 IHSS 108	Section 7.3 Page 68 Table 7.1	Added "No respirators required when personnel or equipment are not exiting the High Contamination Area and the Continuous Air Monitors (CAMs) are operational." to footnote number 3 which addresses respiratory protection in the CONTAMINATION AREAS WITHIN VESTIBULES	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.3 Page 69 Table 7.1	Added "or equivalent" footnote to the PPE required for the body in the RADIOLOGICAL BUFFER AREAS	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.3.3 Page 72	Deleted "full-facepiece air-purifying respirator with HEPA cartridges or" from lists of what constitutes level B personal protective equipment	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.4.3.2 Page 88	Added the level at which the MiniRam needs to be cleaned	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.4.3.4 Page 89	Changed the heat stress monitoring instrument to Metrosystems, Inc., Model HS-3700	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.4.4 Page 91	Changed pump calibrator from Bios International DC-1 to A.P. Buck, Inc., Model M-5 (mini-Buck)	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.4.4 Page 91	Changed the models of the sampling pumps from Mine Safety Appliances, Co., Model Escort Elf and SKC, Model 224-PCXR4 to Mine Safety Appliances, Co., Model LC and SKC, Model 224-PCXR7	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.4.4 Page 92 Table 7.3	Deleted Sulfur Dioxide sampling. Added total Uranium sampling. Changed Oxides of Nitrogen sampling method from S 321 to NIOSH 6014	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.7.1 Page 97	Revised the response to Radiological Air Sampling Result ->RWP Suspension Guide Limits In the Temporary Structure	WHL	DF	~	WHL	NA ADD	NA ADD
1	6-4-98	RF/RMRS-97-010		Section 7.7.2 Page 98	Revised the response to a CAM Alarm Inside the Temporary Structure Vestibule (CAMFZ)	WHL	DF	~	WHL	NA ADD	NA ADD

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description Of Change(s)	Responsible Manager Approval	ES&H Approval	Biological Engineering Approval	Quality Assurance Approval	Completion Of ADRA 2.8.1 Checklist	Completion Of SRS/NOG Checklist
1	6-4-98	RF/RMRS-97-010	Final Site Specific Health and Safety Plan for the Source Removal at Trench 1 HSS 108	Section 8.1.2 Page 107	Deleted the last bullet addressing combustible materials stored within two feet of the ceiling	WJK	DF	OK	WJK	NA-ND	NA-ND
1	6-4-98	RF/RMRS-97-010		Section 9.5.1 Page 116	Changed internally lit exit signs to glow in the dark exit signs	WJK	DF	OK	WJK	NA-ND	NA-ND
1	6-4-98	RF/RMRS-97-010		Appendix D	Remove Appendix D in its entirety	WJK	DF	OK	WJK	NA-ND	NA-ND

1 Affixed signatures indicate that Operations Review Committee (ORC) and/or Independent Safety Reviews are NOT applicable because Scope and Fundamental Technical Specifications were NOT changed. Also, related documents affected by the change(s) were modified accordingly.

7.5.2	Equipment Decontamination	93
7.5.3	Management of Decontamination Liquids and Incidental Waters	94
7.6	WORK PRACTICES	94
7.6.1	Radiological Work Permit (RWP)	94
7.6.2	Prohibited Activities	94
7.6.3	Spill Prevention	94
7.6.4	Dust Control Measures	95
7.6.5	Buddy System	95
7.6.6	Communications	96
7.6.7	Confined Space Entry	96
7.6.8	Illumination	96
7.6.9	Sanitation	96
7.7	UNANTICIPATED HAZARDS OR CONDITIONS	96
7.7.1	Radiological Air Sample Results > RWP Suspension Limits in the Temporary Structure	97
7.7.2	CAM Alarm Inside the Temporary Structure Vestibule (CA/EZ)	98
7.7.3	Equipment Radiological Contamination or Radiation Levels > RWP Suspension Limits	99
7.7.4	Personnel Radiological Contamination	100
7.7.5	Confirmed Presence of Plutonium or Fissile/Enriched Uranium	100
7.7.6	Chemical Air Monitoring > Action Levels in the RBA/CRZ or Outside the Temporary Structure	101
7.7.7	Chemical Air Monitoring or Sample Results > IDLH Action Levels	102
7.7.8	Personnel Chemical Contamination	103
7.7.9	Confirmed Presence of Beryllium	103
7.7.10	Confirmed Presence of Arsenic or Cadmium	103
7.7.11	Encountering Unusual Debris During Excavation	104
7.7.12	Presence of Volatile Organic Compounds in Soil	105
7.7.13	Breathing Air Compressor Failure	105
7.7.14	Radiation Monitor Alarm Inside the Temporary Structure	105
8.0	FIRE PROTECTION PLAN	107
8.1	COMBUSTIBLE MATERIALS - CLASS A FIRES	107
8.1.1	Temporary Structure	107
8.1.2	Temporary Field Trailers	107
8.2	FLAMMABLE AND COMBUSTIBLE LIQUIDS - CLASS B FIRES	108
8.2.1	Temporary Structure	108
8.2.2	Temporary Field Trailers	108
8.3	ENERGIZED ELECTRICAL EQUIPMENT - CLASS C FIRES	108
8.3.1	Temporary Structure	109
8.3.2	Temporary Field Trailers	109
8.4	COMBUSTIBLE METALS - CLASS D FIRES	109
8.4.1	Temporary Structure	110
8.4.2	Temporary Field Trailers	110
8.5	GENERAL FIRE PREVENTION MEASURES	111
8.5.1	Storage and Use of Flammable Gases	111
8.5.2	Control of Ignition Sources	111

8/10/98

7/10/98

LIST OF FIGURES

Figure 3.1	RFETS Site Location Map	5
Figure 3.2	Trench 1 Site Location Map	9
Figure 3.3	Trench 1 Site Layout Map	10
Figure 3.4	Trench 1 Temporary Structure Layout Map	11
Figure 9.1	Emergency Response Map	117
Figure 9.2	Map to RFETS Medical - Building 122	119

LIST OF APPENDICES

Appendix A	Project Phone List
Appendix B	Activity Hazard Analyses
Appendix C	Heat and Cold Stress Guidelines

6/8/98

pierced. Venting will be performed inside the trench prior to removal of the drum from the trench. During the venting of the drums, all personnel in the immediate excavation work area will relocate to predetermined locations away from the trench.

After each intact drum has been vented, individual drums will be carefully removed from the excavation using the excavator bucket, and placed into a shallow plastic containment pan for initial characterization as shown in Table 4.1. If the initial characterization indicates that the drum can be safely handled, the drum will be placed in a overpack drum or other container and transported to the SIP for further evaluation of the drum contents.

If a drum is not intact, the drum and/or drum fragments and approximately one cubic yard of surrounding soil and material will be removed from the trench and placed directly into a steel waste package. The material will undergo the same initial characterization as for intact drums and segregated as indicated in Section 4.2.1.

4.1.2 Excavation of Soil

Excavated soil will be raised in the excavator bucket and the bucket will be placed on the ground. Soil in the bucket will be initially characterized as shown in Table 4.1 and segregated based on the characterization results (See Section 4.2.2).

4.1.3 Excavation of Debris

Miscellaneous debris and trash excavated from the trench is expected to include compatible materials such as waste personal protective equipment, wood, metal, rubber, plastics, paper, and glass. Immediately following removal from the trench and while still in the excavator bucket, these items will be visually inspected for stains or discolorations and initially characterized as shown in Table 4.1.

4.1.4 Excavation of Unknown Materials

It is important to note that unknown materials do not necessarily constitute an Unanticipated Hazard or Condition. If, however, unknown material are discovered, they will be evaluated in accordance with RMRS Directive-001 as presented in Section 7.7.

Materials or containers with liquids and/or sludge which cannot be immediately identified will be inspected for labels, markings, or other information and initially characterized as shown in Table 4.1. If it can be done safely based on the initial characterization and the RMRS Directive-001 evaluation, the material or container will then be appropriately packaged and transferred to the SIP for further evaluation.

4.1.5 Excavation of Suspected Classified Items

Items suspected of being "classified" will be initially characterized per Table 4.1. They will then be isolated and the RFETS Classification Office will be contacted to determine if the item is classified. If classified, the item will be secured and the final disposition will be determined by the Classification Office.

4.2 TASK 2 - SEGREGATION AND PACKAGING OF DRUMS, SOIL, DEBRIS, UNKNOWN MATERIAL, AND SUSPECTED CLASSIFIED ITEMS

Drums, soil, debris, unidentifiable material, and suspected classified items will be segregated and packaged according to identifiable waste types and the results of initial field characterization. To the extent possible, all material will be segregated and packaged adjacent to the trench using the excavator bucket. If manual handling of material is necessary, remote handling devices will be used when feasible. Waste packaging will be conducted in accordance with Operations Order No. 00-T1-07 *Packaging of Trench T-1 Waste*.

4.2.1 Segregation and Packaging of Drums

Intact drums containing depleted uranium, still bottoms, cemented cyanide, or unknown material will be removed from the trench, initially characterized, and if they have sufficient structural integrity for hoisting, placed in an overpack drum. If the intact drums do not have sufficient structural integrity, they will be placed in an approved waste package. Hoisting of intact drums into overpack drums will be done with a hoisting apparatus designed for placing 55-gallon drums into overpacks. A Lifting Plan has been developed for the overpacking of intact drums and a hoisting and rigging checklist will be completed per HSP- 12.02, *Hoisting and Rigging*. The waste package will then be transferred to the SIP where the contents will be further characterized, sampled, and segregated by SIP personnel. Drums containing depleted uranium chips will be stabilized by inerting with mineral oil, appropriately packaged for offsite shipment, and transferred to the Waste Container Staging Area located outside of the temporary structure. Cemented cyanide and still bottom wastes will be sampled, appropriately packaged, and staged in the Waste Container Staging Area. Upon receipt of analytical results, cemented cyanide and still bottom wastes will be managed for appropriate treatment and/or disposal.

Non-intact drums and associated soil will be removed from the trench and segregated based on the initial characterization. The initial characterization will be conducted while the material is still in the excavator bucket so that depleted uranium and non-depleted uranium-containing waste streams are not placed in the same waste package.

As the packages containing depleted uranium material are being filled, personnel may remove drum fragments and rake the soil to minimize voids. Drum fragments will be surveyed and placed in a separate waste container designated for debris. Packages containing or suspected of containing depleted uranium

24/8/10

Task specific activities required to manage the Waste Container Staging Area include the following:

- conducting formal documented inspections of staging areas at proper intervals;
- inspecting and operating forklifts;
- placing 83 gallon overpack drums into 110 gallon overpack drums in accordance with the Lifting Plan;
- establishing roadways for forklift operations; and
- loading waste containers onto transports.

4.8 TASK 8 - EXCAVATION VERIFICATION SAMPLING

At the completion of excavation operations per the PAM, verification soil samples will be collected along the base and sides of the excavation to determine the post-action condition of the subsurface soils. Verification samples will be collected and analyzed according to the procedures and requirements stated in the *Sampling and Analysis Plan to Support the Source Removal at Trench T-1 Site, IHSS 108* (SAP). The sampling will be performed after a nominal six-inch scrape below the drums and debris to clear the trench bottom of any residual waste material. Visible staining which may extend beneath the trench bottom will also be removed prior to collecting samples. If sample analytical results indicate that contamination is present above cleanup target levels, further excavation and sampling will continue until cleanup target levels are achieved, or one of the limiting conditions discussed below are met.

If contamination is encountered below the bottom of the trench, the excavation will be limited to the highly weathered bedrock, one to three feet below the alluvial/bedrock contact, or to the depth of groundwater, if encountered. Unweathered bedrock will not be excavated. A FID and/or PID as well as a FIDLER will be used as field screening tools to guide the excavation activities before collection of the excavation verification samples.

Activities required to accomplish this sampling include the following:

- inspecting and operating the excavator;
- decontaminating the excavator bucket;
- sampling from the excavator bucket;
- decontaminating sampling equipment; and
- packaging the samples for shipment.

4.9 TASK 9 - SOIL TREATMENT

If substantial quantities of soil are found to be contaminated with VOCs, treatment may be necessary. Low vacuum low temperature thermal desorption or other equally effective technology may be used to treat the soil. If treatment is required, a separate health and safety plan will be developed by the subcontractor.

- the north side of the trench will be barricaded and posted during excavator operations to protect personnel from the swing path of excavator counterweight;
- ground personnel in the support zone will wear orange reflective vests and hard hats when heavy equipment is in use;
- personnel will stay at a safe distance from all heavy equipment and maintain line of sight with the operator;
- when sampling or obtaining readings at the excavator or front-end loader buckets, the operator will set the bucket on the ground, disengage the hydraulic system, set the parking brake, and give a hand signal indicating that ground personnel may approach;
- at no time will any personnel position themselves under hydraulically operated equipment or loads; and
- non-routine backing up of heavy equipment will require a spotter to ensure that the path of travel is clear. In addition, all heavy equipment will have electronic backup alarms which will sound continuously while the equipment is backing.

5.4.2 Excavation Hazards

Excavations pose a hazard due to cave-ins, slips, trips, falls, and underground utilities. Measures used to control these hazards include:

- the preparation and approval of Soil Disturbance Permits which address overhead and underground utility hazards;
- the excavation will be inspected by a competent person (Health and Safety Specialist) prior to each shift, during each shift, and immediately after any rain or snow storms or other hazard increasing occurrences;
- heavy equipment entry into the excavation will not be permitted unless the excavation is properly sloped and entry approval has been obtained from a Kaiser-Hill Excavation Specialist;
- heavy equipment will not be allowed on the north side of the excavation;
- the excavator will be operated in accordance with the manufacturers recommendations in regards to safe operating distances from the excavation;
- at no time will the counterweight on the excavator be positioned above the open excavation;
- a spotter will be present during all excavation activities;
- personnel entry into the excavation will not be permitted unless the excavation is properly sloped and entry approval has been obtained from a Kaiser-Hill Excavation Specialist;
- a warning system such as cones or a rope will be established and personnel will stay a minimum of six feet away from the edge of the excavation when it is not sloped at 1.5:1.

- personnel closer than six feet to the excavation must wear a full body harness and lifeline attached to an approved anchorage point; and
- equipment, except the excavator, will be kept a minimum of two feet away from the edge of the excavation when it is not sloped at 1.5:1.

5.4.3 Noise Exposure Hazards

Work at the site will expose personnel to high noise levels from the operation of heavy equipment and power tools. Excessive noise exposure can cause both temporary and permanent effects on hearing. The temporary effects of excessive noise include ringing in the ears, interference with communication, and hearing threshold changes. The effect of long-term excessive noise includes varying degrees of noise-induced hearing loss. Measures used to control noise exposure hazards will include:

- noise monitoring to determine employee exposure;
- the posting of areas where hearing protection is required;
- hearing protection for exposures of greater than 85 dBA for any length of time;
- noise monitoring to confirm the effectiveness of the hearing protection worn; and
- noise dosimetry to determine employee exposure and whether participation in the Hearing Conservation Program is required. The Hearing Conservation Program includes both training and audiometric testing.

5.4.4 Heat and Cold Stress Hazards

During operations there is a potential for worker exposure to serious temperature extremes. These environmental conditions increase the risk of heat or cold stress during field activities. Measures used to control heat stress exposure will include:

- briefing employees on the causes, prevention, signs/symptoms, and treatment of heat stress;
- monitoring for exposure to heat stress using a Wet Bulb Globe Thermometer (WBGT);
- proper monitoring of employee physiology including heart rate and oral temperature;
- wearing ice vests or other RMRS approved measures;
- instituting a work-rest regimen based on the ACGIH guidelines (See Appendix C);
- providing personnel with a shaded break area and cool liquids; and
- providing for proper acclimatization of all workers to new or changing work conditions.

Measures used to control cold stress exposure will include:

- briefing employees on the causes, prevention, signs/symptoms, and treatment of cold stress;
- monitoring for exposure to cold stress using a dry bulb thermometer and anemometer;
- wearing adequate insulating dry clothing when the air speed and temperature result in an equivalent chill temperature of $<40^{\circ}\text{F}$;
- changing wet clothing;
- instituting a work-warming regimen based on the ACGIH guidelines (See Appendix C) when the equivalent chill temperature is $<19.4^{\circ}\text{F}$;
- providing personnel with a heated break area and warm sweet drinks;
- taking special precautions when handling evaporative liquids such as gasoline at equivalent chill temperatures $<39.2^{\circ}\text{F}$; and
- providing for proper acclimatization of all workers to new or changing work conditions.

5.4.5 Personal Protective Equipment (PPE) Hazards

PPE will be required for most activities placing a physical and mental strain on the wearer. When PPE such as SCBAs, airline respirators, gloves, shoe covers, and protective anti-C coveralls are worn, visibility, hearing, manual dexterity, and communications are impaired. Additionally, the risk of heat stress increases. Measures used to control these hazards will include:

- minimizing the number of personnel entering areas requiring PPE;
- PPE will be inspected prior to use;
- keeping the work area clear of trip hazards through diligent housekeeping;
- providing radios for communication;
- developing hand signals for communication;
- use the buddy system to ensure clothing integrity; and
- monitoring for and preventing heat stress as described above.

5.4.6 Overhead Power Line Hazards

Special precautions must be taken when working or operating heavy equipment in the vicinity of overhead energized power lines. Contact with electrical power lines can cause shock, burns, or death. Measures used to control overhead power line hazards will include:

- assume all overhead lines are energized;
- heavy equipment will be operated with a 10' minimum clearance between power lines and any part of the equipment; and
- strictly adhering to RFETS Health and Safety Practices Manual (HSP) 2.08, *Lock Out/Tag Out* when conducting lock out/tag out operations on overhead lines.

5.4.7 Vehicular Traffic Hazards

Due to the large number of expected vehicles, limited space at the Trench 1 Site, and the hazard associated with crossing roads during peak traffic periods, the areas north and east of the site will be used for parking. In addition, some work will be conducted along northernmost inbound lane from the east gate which is the southern boundary of the Trench 1 Site. Employees shall exhibit special caution when accessing the site along active roadways and when working along active roadways. Measures used to control traffic hazards will include:

- wearing orange vests when working near active roadways;
- positioning flagpersons along active roadways to control traffic;
- closing roads as needed; and
- placing jersey barriers around regularly occupied work areas.

5.4.8 Portable Electric Generator Hazards

Due to a lack of permanently installed electrical power, portable electric generators will be used during the project. Generators may be used to power portable hand tools and light stands, pumps, and the radiological air samplers. Measures used to control the hazards associated with the use of generators will include:

- extension cords will be intended for outdoor use, inspected by the user, and protected from unnecessary damage;
- any extension cords which show signs of damage or deterioration will be immediately tagged out of service;
- generators will be equipped with GFCI outlets which will be tested daily by the user;
- generators will be properly grounded via a ground rod as required;
- a 10 lb. ABC fire extinguisher will be located next to all generators;
- if possible, refueling will be conducted at the beginning of the shift when the generators are cool; and
- refueling will be conducted with the generator on the ground surface or with the generator grounded to the fuel dispenser.

The RFETS Lock Out/Tag Out Program (HSP 2.08) will be *strictly* adhered to during the servicing and maintenance of machines or equipment in which the unexpected energization or start up of the machine or equipment, or release of stored energy could cause injury to personnel.

6/10/98

Table 7.1
 Personal Protective Equipment Summary

HIGH CONTAMINATION AREA WITHIN TEMPORARY STRUCTURE							
Tasks	Level	Body ¹	Foot	Head	Eye ²	Hand	Respirator ³
<ul style="list-style-type: none"> Excavation of drums, soil, debris, unknown material, and suspected classified items Segregation of drums, soil, debris, unknown material, and suspected classified items Transport of material to the Sampling and Inerting Pad (SIP) Sampling and Inerting Pad (SIP) Operations Transport of soil to the soil stockpile Management of soil stockpile Excavation Verification Sampling Soil transport and backfill Decontamination of Equipment or materials Surveying equipment, materials, and soil Conducting surveys for depositing of HCA 	B or C	Inner and outer Anti-C coveralls	Hard toed safety shoes, two pair of shoe covers, and two pair rubber overshoes	Hood	None	Two pairs inner surgeon and one pair outer nitrile gloves (cotton liners optional). Heavy duty work gloves as necessary. Lead loaded gloves (30 mil equivalent Pb) will be worn by personnel who directly handle depleted uranium unless directed otherwise by Radiological Engineering.	Supplied air, SCBA, or full-face air-purifying respirator with HEPA cartridges
¹ If splash hazards exists and cannot be mitigated, polycoated Anti-Cs or polycoated long sleeve aprons will be worn. ² No eye protection will be required when a full facepiece respirator is worn. ³ Work may be conducted in Level C respiratory protection if continuous real-time air monitoring indicates no action levels are exceeded and no excavation is being conducted.							

CONTAMINATION AREA WITHIN TEMPORARY STRUCTURE							
Tasks	Level	Body ¹	Foot	Head	Eye ²	Hand	Respirator ³
<ul style="list-style-type: none"> Surveying equipment, material, and soil Soil transport and backfill Decontamination of equipment or materials Conducting surveys for depositing of CA Other miscellaneous tasks 	B or C	Anti-C coveralls	Hard toed safety shoes, shoe covers, and rubber overshoes	Hood	None	One pair inner surgeon and one pair outer nitrile gloves (cotton liners optional). Heavy duty work gloves as necessary	Supplied air, SCBA, or full-face air-purifying respirator with HEPA cartridges
¹ If splash hazards exists and cannot be mitigated, polycoated Anti-Cs polycoated long sleeve aprons will be worn. ² No eye protection will be required when a full facepiece respirator is worn. ³ Work may be conducted in Level C respiratory protection if continuous real-time air monitoring indicates no action levels are exceeded and no excavation is being conducted.							

CONTAMINATION AREAS WITHIN VESTIBULES							
Tasks	Level	Body ¹	Foot	Head	Eye ²	Hand	Respirator ³
<ul style="list-style-type: none"> Frisking personnel at the HCA step-off pad Surveying equipment and material Decontamination of equipment or material Conducting surveys for depositing of CA Other miscellaneous tasks 	C	Anti-C coveralls	Hard toed safety shoes, shoe covers, and rubber overshoes	Hood	None	One pair inner surgeon and one pair outer nitrile gloves (cotton liners optional). Heavy duty work gloves as necessary. When hands cross into the HCA/EZ for frisking activities, an additional pair of surgeons are required	Full-face air-purifying respirator with HEPA cartridges or none
¹ If splash hazards exists and cannot be mitigated, polycoated Anti-Cs polycoated long sleeve aprons will be worn. ² No eye protection will be required when a full facepiece respirator is worn. ³ Depending on the results of chemical and particulate air monitoring, SCBA or supplied air respiratory protection may be required. No respirators required when personnel or equipment are not exiting the High Contamination Area and the Continuous Air Monitors (CAMs) are operational.							

6/16/98

Table 7.1
 Personal Protective Equipment Summary (cont.)

RADIOLOGICAL BUFFER AREAS							
Tasks	Level	Body ¹	Foot	Head	Eye	Hand	Respirator
<ul style="list-style-type: none"> • Frisking personnel at the CA step-off pad • Surveying equipment and material • Other miscellaneous tasks 	Modified D	Over the shoulder DOE coveralls	Hard toed safety shoes	None	Safety glasses with side shields	One pair inner surgeon if conducting radiological surveys (cotton liners optional). Heavy duty work gloves as necessary	None

¹ or equivalent

SUPPORT ZONE AND WASTE CONTAINER STAGING AREA							
Tasks	Level	Body ¹	Foot	Head	Eye	Hand	Respirator
<ul style="list-style-type: none"> • Management of waste containers • Surveying equipment and material • Site reclamation • Other miscellaneous tasks 	Modified D	Over the shoulder DOE coverall	Hard toed safety shoes	Hard hat	Safety glasses with side shields	Heavy duty work gloves as necessary. Surgeon gloves when surveying equipment and materials.	None

¹ or equivalent

- rubber overshoes (two pair in a HCA);
- hood;
- full-facepiece Supplied Air Respirator (SAR) or Self Contained Breathing Apparatus SCBA;
- hard toe safety shoes;
- hard hat; and
- heavy duty leather gloves as needed.

When conducting "heavy" work in the "High Contamination Area", Level B PPE may consist of the following:

- two pairs of Anti-C coveralls;
- cotton glove liners (optional);
- two pairs of inner surgeon and one pair outer nitrile or lead loaded gloves;
- two pairs of shoe covers;
- two pairs rubber overshoes;
- hood;
- full-facepiece Supplied Air Respirator (SAR) or Self Contained Breathing Apparatus (SCBA);
- hard toe safety shoes;
- hard hat; and
- heavy duty leather gloves as needed.

7.3.4 Storage, Inspection, and Maintenance of PPE

Clothing and respirators must be properly stored to prevent damage and/or malfunction due to exposure to dust, sunlight, damaging chemicals, and impact. Proper storage of PPE and respirators will include the following:

- clothing and respirators will be stored in a dry, clean, uncontaminated area out of direct sunlight;
- clothing and respirators will not be stored in proximity to any chemicals such as gasoline;
- clothing will be stacked in orderly fashion so that no other objects or equipment are on top of them leading to tears, punctures, rips, or deformations;
- all SCBAs and airline respirators will be properly placed in their cases;
- all full-facepiece air-purifying respirators will be stored in clear plastic bags in a single layer with no other objects or equipment placed on top of them which could lead to deformation of the facepiece; and

7.4.3 Miscellaneous Monitoring

In addition to VOC and radiological monitoring, numerous other potential hazards exist which require the use of real-time monitoring instruments. These hazards include noise, particulates, wind speed, heat and cold stress, explosive/oxygen deficient atmospheres, diesel combustion gases, and hydrogen cyanide.

Additional monitoring may be performed and equivalent instruments may be substituted at the discretion of the Site Safety Officer and the Health and Safety Supervisor.

7.4.3.1 Noise Monitoring

Noise levels will be monitored to delineate areas or activities where hearing protection is required, the effectiveness of hearing protection required, and whether or not personnel need to participate in a Hearing Conservation Program. The instrument used will be an Ametek, Model MK-3, audio dosimeter. The MK-3 is a microprocessor controlled personal monitor that measures noise exposure in the dBA range and displays a variety of results including real-time dBA level, exposure time, exposure dose, average dBA level, maximum dBA level, and the 8-hour time weighted exposure dose. The MK-3 is calibrated on a daily basis before and after use. Daily calibrations will be per the manufacturer's specifications and results will be entered in the Industrial Hygiene Instrumentation Calibration Logbook. Real-time noise monitoring results will be recorded on the Daily Industrial Hygiene Monitoring Log. Annual calibration and service of the instrument and the calibrator is required.

7.4.3.2 Particulate Monitoring

Particulate monitoring will be accomplished using a Monitoring Instruments for the Environment, Inc., Model PDM-3, Miniature Real-time Aerosol Monitor (miniram). The miniram is an airborne particulate monitor whose operating principle is based on the scattered electromagnetic radiation in the near infrared. The miniram continuously senses the particles in the sensing chamber and displays the particulate levels in mg/m^3 . Because the miniram is preferential to particles 0.1 to 10 micrometers in size, it is useful in determining the levels of not only respirable particulates but fumes, smokes, and fogs. The instrument will be zero calibrated using a dust free Z-Bag prior to each use and results will be entered in the Industrial Hygiene Instrumentation Calibration Logbook. Periodic cleaning of the sensing chamber is required when the Z-Bag background level reading is $>3.0 \text{ mg}/\text{m}^3$. A yearly factory calibration and servicing is recommended. Monitoring will be conducted during all dust generating activities and results will be recorded on the Daily Industrial Hygiene Monitoring Log.

7.4.3.3 Wind Speed Monitoring

Wind speed will be monitored continuously throughout all phases of the project to ensure compliance with

6/8/98

FO.01, *Air Monitoring and Dust Control*. This will be done by the use of a weather station equipped with a R.M. Young Co., Model 05103 Wind Speed Monitor. The monitor is calibrated semi-annually.

A Davis Instruments, Corp., Model Turbo Meter, handheld electronic wind speed monitor may also be used. The Turbo Meter uses a turbine which is suspended on sapphire jewel bearings. The turbine rotation is sensed by an infrared light beam whose signal is processed by a large scale integrated circuit. The Turbo Meter is factory calibrated and requires no maintenance except minor cleaning.

7.4.3.4 Heat Stress Monitoring

Heat stress monitoring will be completed using a Metrosonics, Inc., Model HS-3700, Heat Stress Monitor. The instrument is a micro-processor based Wet Bulb Globe Thermometer (WBGT) which accurately measures environmental factors which contribute to heat stress. The WBGT reading displayed by the instrument, in either Fahrenheit or Celsius, is a weighted sum of the dry bulb, wet bulb, and verner globe temperatures. The WBGT is factory calibrated on an annual basis. Maintenance is minimal with only the wet bulb wick requiring periodic replacement. Monitoring frequency will depend on the work area temperature, the type of work being performed, and the type of PPE worn. See Appendix C for guidance and action levels for work involving the use of personal protective equipment. Readings in the field will be logged on the Daily WBGT Log.

In addition to WBGT monitoring, physiological heat stress monitoring will be performed in accordance with the NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* as follows:

- Heart Rate Monitoring - The SSO or HSS will count the radial pulse of personnel exiting the Contamination Area or High Contamination Area as early as possible after exiting the Radiological Buffer Area. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate exceeds 110 beats per minute at the beginning of the next rest period, shorten the next work cycle by one-third.
- Oral Temperature - Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the beginning of the rest period before drinking. If oral temperature exceeds 99.6°F, shorten the next work cycle by one-third and keep the rest period the same. If the oral temperature still exceeds 99.6°F at the beginning of the next rest period, shorten the next work cycle by one-third.
NOTE: Personnel will not be allowed to wear semipermeable or impermeable coveralls when his/her oral temperature exceeds 100.6°F.
- Since it is not possible to monitor the heart rate and/or oral temperature of all personnel exiting the Contamination Areas or High Contamination Area, monitoring will be

pump is leak tested daily prior to use. Monitoring results will be recorded on the Daily Industrial Hygiene Monitoring Log.

7.4.3.8 Hydrogen Cyanide Monitoring

Monitoring for hydrogen cyanide will be accomplished using a Sensidyne Inc. Gas Sampling System equipped with hydrogen cyanide colorimetric tubes. The tubes have a range of 2.0 - 50 parts-per-million. The hand held sampling pump is leak tested daily prior to use and monitoring results will be recorded on the Daily Industrial Hygiene Monitoring Log.

7.4.3.9 Depleted Uranium Temperature Monitoring

Temperature measurements of depleted uranium in drums or soil will be obtained to provide an indication of rapid oxidation which may lead to the ignition of the depleted uranium. In addition, temperature measurements will be obtained by the Starmet HSS just prior to inerting to verify that the depleted uranium is not undergoing a thermal reaction which could ignite the mineral oil. Measurements will be obtained using a Newport Electronics Inc., Model OS521 handheld infrared thermometer in accordance with Operations Order No. 00-T1-09 *Temperature Measurements of Depleted Uranium Using Infrared Heat Gun*

7.4.4 Personal and Area Integrated Air Sampling

6/10/98
In addition to real-time monitoring, personal and area integrated air sampling will be conducted, at the discretion of the Health and Safety Supervisor, at the excavation, the SIP, and the soil stockpile for VOCs, metals, cyanides, diesel emission gases, and dust. Job functions or work areas in the HCA/EZ and CA/EZ will be observed in order to sample the highest risk employees or areas. Samples will be obtained using Mine Safety Appliances, Co., Model Escort LC and SKC, Model 224-PCXR7, personal sampling pumps. The pumps will be calibrated before and after sampling using an A.P. Buck, Inc., Model M-5 (mini-Buck) primary gas flow calibrator. Daily calibration will be per the manufacturers specifications and results will be entered in the Industrial Hygiene Instrumentation Calibration Logbook. The mini-Buck is a National Institute of Science and Technology (NIST) traceable calibrator which is certified on a yearly basis by the manufacturer. All samples will be obtained in accordance with the procedures contained in the NIOSH Manual of Analytical Methods. Samples will be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory. Table 7.3 is a list of the analytes to be sampled and the methods to be used. At the onset of the project all analytes will be sampled for on a daily basis. After review of the personal and/or area integrated sampling results, and at the discretion of the Health and Safety Supervisor (Certified Industrial Hygienist), the sampling frequency may be adjusted.

Table 7.3
 Integrated Air Sampling

ANALYTE	TYPE OF SAMPLE	METHOD(S)
Arsenic	Area & Personal	NIOSH 7300
Beryllium	Area & Personal	NIOSH 7300
Copper	Area & Personal	NIOSH 7300
Cadmium	Area & Personal	NIOSH 7300
Total Uranium	Area & Personal	Laboratory Method
Cyanides (particulate)	Area	NIOSH 7904
Oxides of Nitrogen	Area	NIOSH 6014
VOCs	Area & Personal	Carbon Tetrachloride NIOSH 1003 Methylene Chloride NIOSH 1005 Perchloroethylene NIOSH 1003 Trichloroethylene NIOSH 1022
Respirable Dust	Area & Personal	NIOSH 600

7.5 DECONTAMINATION

Personnel and equipment contamination prevention techniques will be used wherever feasible. Personnel will avoid unnecessary contact with potentially contaminated material and will adhere to the work practices outlined in Section 7.6. Heavy equipment will be operated in a manner which limits the spread of contaminated or potentially contaminated material.

7.5.1 Personnel Decontamination

To minimize the potential for personal contamination, gross decontamination will be performed on personnel exiting the HCA/EZ prior to doffing their outer layer of Anti-C's and stepping to the inner step-off pad. This decontamination will also serve to prevent the spread of contamination into "clean" areas of the site. Once decontaminated, personnel shall remove PPE as outlined in Section 7.3.5 and step to the inner step-off pad where a whole body frisk will be conducted. Based on a visual determination, PPE suspected of being chemically contaminated will be bagged separately.

and whether the controls on the project are sufficient to address the hazard or condition. Based on this initial evaluation, a determination will be made whether to proceed with controls currently in place; segregate the hazard or condition from the project activity, if it can be done safely; or curtail operations to address the unexpected hazard or condition. Concurrence to proceed down the selected path must be obtained from the RMRS Environmental Restoration Director or designee. In addition, the resumption of field activities involving radiological issues will be in accordance with Article 345 of the RFETS Radiological Control Manual."

Note: "Unanticipated Hazards or Conditions" do not replace conditions which require emergency response, rather, they ensure that all work is performed based on an informed approach in regards to all known or potential hazards.

The following sections list possible "Unanticipated Hazards or Conditions" and the corresponding response action.

7.7.1 Radiological Air Sample Result > RWP Suspension Guide Limits in the Temporary Structure

In order to protect workers within the temporary structure and to prevent the spread of contamination to the outside environment, high and low volume radiological air samples will be obtained inside the temporary structure.

If elevated readings are obtained during the initial counting of a high or low volume radiological air sample, the sample will be evaluated to determine if the elevated reading is due to naturally occurring radioactive material or Uranium²³⁸. Evaluation methods may include radon decay tracking, SAIC, Model AP-2 portable alpha analyzer analysis, gamma/alpha spectroscopy analysis, or other analysis as determined by Radiological Safety Technical Supervisor. If an air sample result is confirmed to be greater than the RWP suspension limit for Uranium²³⁸, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- RCT's not wearing respiratory protection in the RBA/CRZ will immediately exit the temporary structure;
- the Radiological Safety Technical Supervisor will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- all doors will be closed as much as possible;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;

6/18/98

- SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
- the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, the ventilation system will be shut down, all vents will be closed, and remaining personnel will exit the temporary structure;
- based on sample and radiological survey results, potential personal radiological exposures will be reviewed;
- site controls and work practices will be reviewed and modified as necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.2 CAM Alarm Inside the Temporary Structure Vestibule (CA/EZ)

Continuous Air Monitors will be operated in the temporary structure vestibules. If a CAM alarms, the following actions will be taken:

- personnel not wearing respiratory protection in the vestibule with the alarming CAM will immediately exit the temporary structure and relocate to a safe upwind assembly area;
- the Radiological Safety Technical Supervisor will be notified;
- the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- personnel outside the temporary structure will relocate to a safe upwind assembly area;
- all doors will be closed as much as possible;
- if possible, personnel wearing SCBAs will refill their SCBAs at the non-alarming CAM vestibule;
- the alarm will be evaluated in accordance with RSP-4.01 *Continuous Air Monitor - Use*

If a CAM alarm is verified as positive, the following actions will be taken:

- all nonessential personnel will exit the temporary structure as directed by RCTs and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- high and low volume air samples inside and outside the temporary structure will be obtained and evaluated;
- all doors will be kept closed as much as possible;
- breathing air compressors in proximity to the alarming vestibule CAM will be shut down;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;

- SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
- the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, the ventilation system will be shut down, all vents will be closed, and remaining personnel will exit the temporary structure via a non-alarming CAM vestibule or as directed by RCTs if the CAMs in both vestibules are alarming;
- based on sample and radiological survey results, potential personal radiological exposures will be reviewed;
- site controls and work practices will be reviewed and modified as necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.3 Equipment Radiological Contamination or Radiation Levels > RWP Suspension Limits

Should Uranium²³⁸ contamination or radiation levels greater than the suspension limits stated on the RWP be detected, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on the survey results, site controls, and work practices will be reviewed and modified as necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.4 Personnel Radiological Contamination

Personnel will be frisked when exiting the CA/EZ. If levels >MDC of the instrument at the outer step-off pad are detected on personnel after the removal of personal protective equipment, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- depending on the location and level of contamination, the appropriate actions will be taken to protect the contaminated individual and personnel in the area;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on the contamination levels, site controls and work practices will be reviewed and modified, if necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.5 Confirmed Presence of Plutonium or Fissile/Enriched Uranium

Should AP-2 portable alpha analyzer, gamma/alpha spectroscopy, or laboratory analysis indicate the presence Plutonium or fissile/enriched Uranium above the action levels stated in Table 7.2, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- RCT's not wearing respiratory protection in the RBA/CRZ will immediately exit the temporary structure;
- the Radiological Safety Technical Supervisor will be notified;
- Nuclear Safety, Criticality Safety, and Air Quality will be notified as appropriate;

- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- the ventilation system will be shut down and all doors and vents will be closed;
- if DAC values do not exceed the protection factor of the respirators being worn, all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- DAC value will be recalculated and potential personal radiological exposures will be evaluated;
- based on the level of Plutonium or fissile/enriched Uranium, site controls and work practices will be reviewed and modified as necessary; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.6 Chemical Air Monitoring > Action Levels in the RBA/CRZ or Outside the Temporary Structure

In order to protect collocated workers in the RBA/CRZ and project support zone, real-time chemical air monitoring will be conducted in those areas. Should real-time air monitoring indicate the sustained presence (approximately ten seconds) of chemicals at levels greater than the action levels for personnel without respiratory protection in the RBA/CRZ and project support zone, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- all personnel in the RBA/CRZ and support zone will be relocated to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*)
- Industrial Hygiene supervision will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and

- the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on monitoring results potential personal chemical exposures will be reviewed;
- based on monitoring results, site control and work practices will be reviewed and modified; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.7 Chemical Air Monitoring or Sample Results > IDLH Action Levels

The exhaust system on the temporary structure is designed to maintain atmospheric chemical levels below the level which is Immediately Dangerous to Life and Health (IDLH). However, if real-time air monitoring or personal or area integrated sample results indicate chemical levels greater than the IDLH for any chemical, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- Industrial Hygiene supervision will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area;
- if real-time air monitoring results do not exceed the protection factor of the respirators being worn, all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on air monitoring and sampling results, potential personal chemical exposures will be reviewed;
- based on air monitoring and sampling results, work practices and engineering controls will be reviewed and modified; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.8 Personnel Chemical Contamination

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his/her coworker(s) will immediately leave the work area for which the PPE was required. Re-entry to the area will not be permitted until the equipment has been repaired or replaced. If any incidents occur that involve the wetting of non-impermeable clothing with hazardous substances, the visual chemical contamination of the modesty clothing or skin, or an employee experiences symptoms of contamination such as skin irritation, the following actions will be taken:

- the Field Operations Deputy Project Manager and Field Operations Deputy Project Manager will be notified immediately;
- the RFETS emergency services at extension 2911 will be notified;
- chemically contaminated personnel should proceed to the nearest decontamination safety shower, remove affected clothing, and thoroughly irrigate the contaminated areas. Emergency shower and eyewash stations are located at numerous locations at the site (see Figure 3.4 for locations); and
- the chemically contaminated individual will be transported to RFETS Occupational Medicine for evaluation;
- based on the severity and cause of the personal chemical contamination, work practices will be reviewed and modified as necessary;

7.7.9 Confirmed Presence of Beryllium

If personal or area integrated air sample results exceed $0.5 \mu\text{g}/\text{m}^3$ or if surface contamination swipe sample results exceed $2.0 \mu\text{g}/\text{ft}^2$, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- Industrial Hygiene supervision will be notified;
- the temporary structure will be posted as a "Beryllium Area";
- based on air sampling and surface contamination results, site control, work practices, training requirements, and medical surveillance will be reviewed and modified; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume

7.7.10 Confirmed Presence of Arsenic or Cadmium

Personal or area integrated air samples for Arsenic and Cadmium are not anticipated to exceed the Permissible Exposure Limit. However, if results exceed $0.01 \text{ mg}/\text{m}^3$ for Arsenic or $0.005 \text{ mg}/\text{m}^3$ for

Cadmium, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- Industrial Hygiene supervision will be notified;
- the temporary structure will be posted as a "Regulated Area" depending on the contaminant present;
- based on air sampling results, site control, work practices, training requirements, and medical surveillance will be reviewed and modified per OSHA Title 29 CFR 1910.1018 *Inorganic Arsenic* or Title 29 CFR 1910.1027 *Cadmium*, as appropriate; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.11 Encountering Unusual Debris During Excavation

Historical data indicates debris associated with Trench 1 Site is limited to waste personal protective equipment, wood, metal, rubber, plastics, fiberglass, paper, and glass. However, if an item such as a sealed canister or a compressed gas cylinder is encountered, the following actions will be taken:

- excavation activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- information regarding the debris will be gathered from a distance. This will include any labels, markings, or other visual clues as to the nature of the debris. If safe to do so, personnel will conduct radiation and contamination surveys and monitor the debris for chemical and combustible gases;
- all nonessential personnel will exit the temporary structure by normal egress routes and relocate to a safe upwind assembly area (*No personnel will be allowed to leave the assembly area.*);
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure;
- based on the information gathered radiological surveys, chemical and combustible gas monitoring results, and other characterization data, further handling of the debris will be evaluated and work practices will be reviewed and modified if necessary; and

- Upon approval from the RMRS Environmental Restoration Director or designee, excavation activities will resume.

7.7.12 Presence of Volatile Organic Compounds in Soil

If analytical results show volatile organic compounds at levels greater than 114 parts-per-million in the soil, Air Quality Management shall be notified to determine if additional air emissions analysis and/or revisions to the Air Pollution Emission Notice will be required.

7.7.13 Breathing Air Compressor Failure

Breathing air for the SCBAs and airline respirators will be supplied by two field located breathing air compressors. The breathing air supply systems are designed so that if the compressors fail there is an adequate supply of stored air to allow personnel to place the depleted uranium in a fire-safe configuration and egress the temporary structure. However, if a compressor fails or an out-of-specification situation as stated in Operations Order No. 00-T1-05, *Use of MSA Custom 4500 II Self Contained Breathing Apparatus and PremAire™ Air Line System* develops, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- RMRS Industrial Hygiene supervision will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
 - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
 - the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

7.7.14 Electronic Personal Dosimeter Alarm Inside the Temporary Structure

Electronic Personal Dosimeters (EPDs) will be issued to selected personnel as determined by Radiological Engineering. The EPDs will track personnel exposures on a daily basis and will alarm at unexpected area radiation dose rates greater than 2mrad/hr. If the alarm on any EPD activates, the following actions will be taken:

- the Field Operations Deputy Project Manager or designee and the Field Supervisor will be notified;
- the Radiological Safety Technical Supervisor will be notified;
- personnel in the temporary structure will relocate to an area of known dose rate less than 2mrad/hr;
- an RCT will respond to the alarming monitor and survey the area with an RO-20 to determine the dose rate level and locate the source of the radiation;
- if dose rates exceed the 2mrad/hr administrative limit, the source of the radiation will be controlled, if possible;
- if dose rates exceed the 5mrad/hr at 30 centimeters, the area will be posted as a "Radiation Area"
- if dose rates exceed 10mrad/hr at 30 centimeters or 300 mrad/hr beta radiation on contact, work will be suspended as stated in section 7.7.3; and
- if work is not suspended, site controls, and work practices will be reviewed and modified as necessary.

8.0 FIRE PREVENTION PLAN

Due to the unique nature of the Trench 1 site and its operations, fire prevention is integral to minimizing the potential for the occurrence of a fire. The following sections describe the preventative measures to be implemented for each type of fire hazard present in both the temporary structure and the field trailers. The fire prevention measures were developed in conjunction with the *Fire Hazard Analysis, Temporary Structures for the Trench 1 Source Removal Project, Revision 0*, which was prepared by RFETS Fire Protection Engineering. General fire prevention measures and fire prevention inspections are discussed at the end of this section.

8.1 COMBUSTIBLE MATERIALS - CLASS A FIRES

This section addresses the fire prevention measures associated with fires in ordinary combustible materials where an ash remains, such as wood, cloth, rubber, and paper.

8.1.1 Temporary Structure

Combustible materials may include wood, paper, rubber, plastic, and spent personal protective equipment excavated from the trench. Personal protective equipment will also be generated by personnel involved with the actual work activities. Fire prevention measures are as follows:

- excavated combustible material will be placed in steel containers which will be sealed at the end of each shift;
- used personal protective equipment will be packaged in sealed steel containers or removed from the temporary structure at the end of each shift; and
- exposed combustible material in the trench will be covered with a sufficient amount of clean soil to ensure that any undetected depleted uranium does not ignite the material

8.1.2 Temporary Field Trailers

Combustible material in the field trailers will include typical office supplies, rubbish, furniture, and stored personal protective equipment. Fire prevention measures are as follows:

- combustible material, including personal protective equipment, shall be stored in an orderly fashion and a high level of housekeeping shall be maintained at all times; and
- combustible material not required for operations shall not be stored within the trailers.

10/1/98

9.4 SITE EVACUATION

The Field Operations Deputy Project Manager, with assistance from the Field Supervisor and the Site Safety Officer directs all evacuations of the Trench 1 Site. Based on the nature and severity of the situation, there are two ways that the Trench 1 Site can be evacuated. They are as follows:

- Immediate Evacuation: Three short blasts from an air horn alarm will indicate an emergency evacuation during which personnel will immediately evacuate the Site. Personnel inside the temporary structure will exit via the nearest exit without stopping for frisking or decontamination.
- Controlled Evacuation: One long blast from an air horn alarm indicates a controlled evacuation. Non-essential personnel inside the temporary structure shall exit the structure following normal egress means including personal frisking and decontamination. All depleted uranium will be placed in a fire-safe configuration via inerting. Once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure.

Regardless of the type of evacuation, the Shift Superintendent will be notified and all personnel will proceed to the designated assembly area and will be accounted for using the Personnel Accountability Tag System. Evacuation routes and assembly areas are shown on Figure 9.1 which will be posted next to the telephones and in prominent locations at the site.

9.5 MEANS OF EGRESS

9.5.1 Temporary Structure

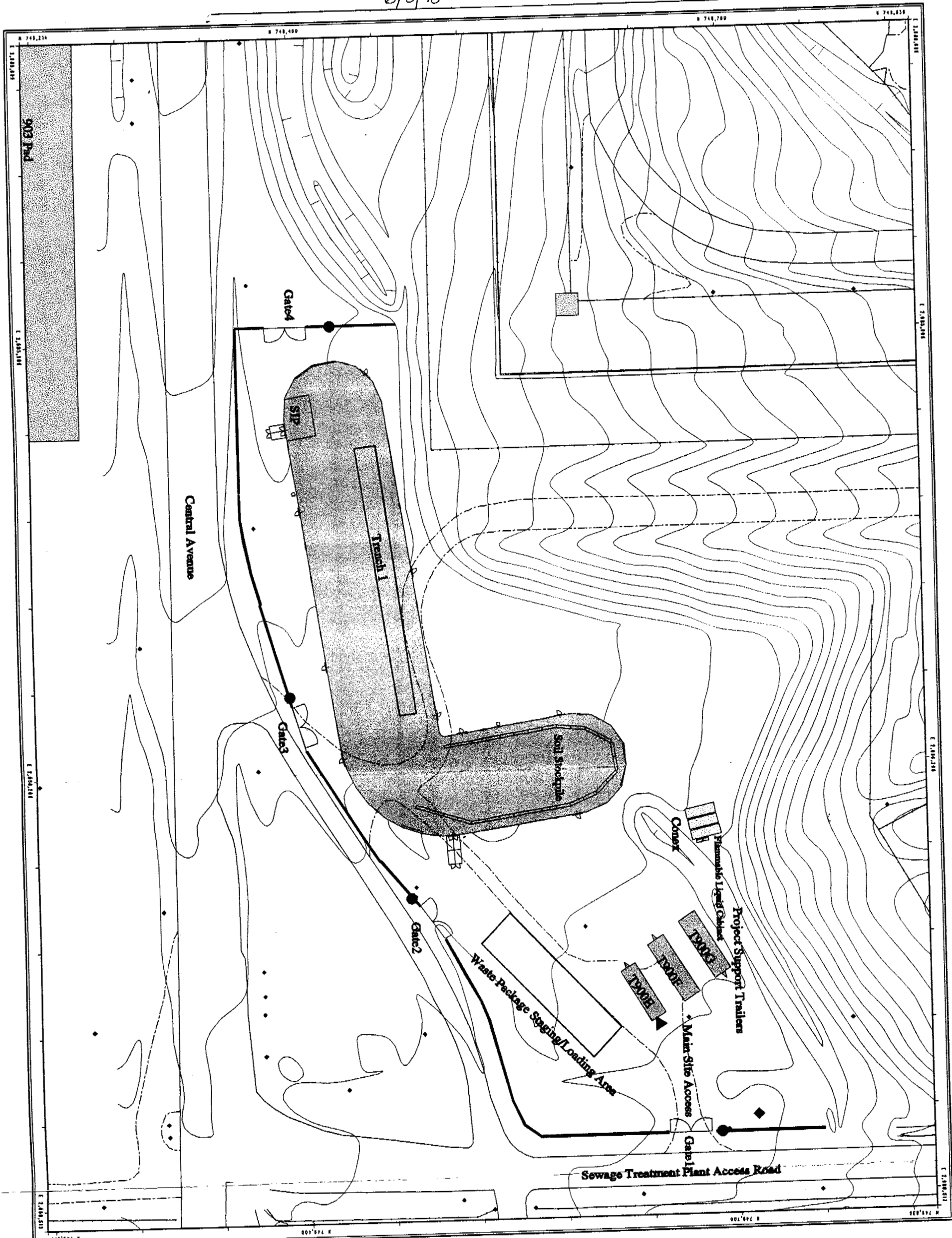
The temporary structure is equipped with nine outward swinging single personnel doors and two outward swinging double personnel doors and are arranged so that the path of travel from any point in the structure is less than 100 feet. All doors measure 36" in width and 6'8" in height and are equipped with panic hardware and marked with glow in the dark exit signs.

9.5.2 Temporary Field Trailers

There are two outward swinging personnel doors from each of the three trailers. Corridors, egress aisles, and doors all measure 36" in width. Signs mark the exit doors and doors which are not exits are also clearly marked. Egress aisles leading to and discharge points from the exits will be kept clear at all times.

6/8/98

6/8/98



Trench 1 Site Layout Figure 3.3

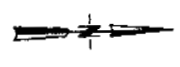
EXPLANATION

- Personnel Access Gate
- ▲ Personnel Accountability Tag Board
- ◆ Primary Assembly Area
- ∨ 2 Foot Contours
- ∨ Safety Fence
- ∨ Trench 1 Boundary
- Temporary Structure Boundary
- SIP = Sampling and Inerting Pad

Standard Map Features

- Buildings and other structures
- Fences and other barriers
- == Paved roads
- Dirt roads

DATA SOURCE:
Topographic, fence, hydrography, roads and other
structures from 1994 aerial photo data
acquired by EG&G RSI, Las Vegas, NV.
Digitized from the orthophotograph, 1995



Scale = 1 : 800
1 inch represents approximately 67 feet



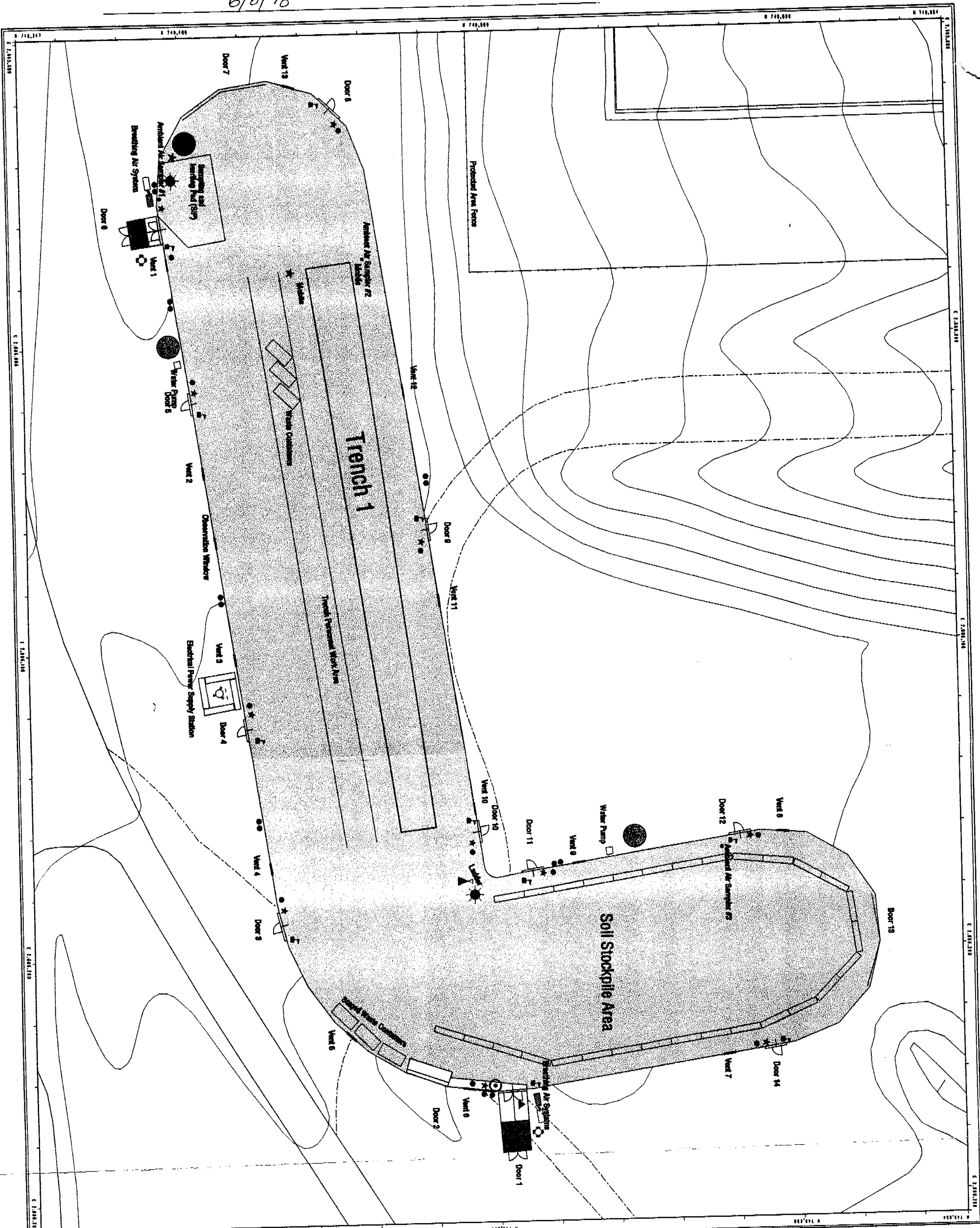
State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site



Prepared by: **RMRS**
MAP ID: 88-0115
May 28, 1998

6/8/98



Trench 1
Temporary Structure Layout
Figure 3.4

EXPLANATION

- 2 Foot Contours
- Trench 1 Boundary
- Permitted Area/Exclusion Zone
- High Contamination Area/Exclusion Zone
- Non-Portable H₂O
- Waste Liquid Storage
- 20 lb Class ABC Dry Chemical Extinguisher
- 60 lb Class ABC Dry Chemical Extinguisher
- 15 Minute Continuous Flow Emergency Shower and Eye Wash Station
- Spill Kit
- Emergency Ventilation Shutdown Button
- Air Horn Alarm
- Electrical Outlet
- Continuous Air Monitor
- Ambient Air Sampler
- 30 lb Class D MEFL-X Extinguisher
- 150 lb Class D MEFL-X Extinguisher
- Standard Map Features
- Fences and other barriers
- Paved roads
- Dirt roads

Scale = 1:370
1 inch represents approximately 31 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

FMRS
Rocky Mountain
Remediation Services, LLC
Rocky Flats Environmental Technology Site
1500 15th Avenue, Suite 400
Boulder, CO 80502-4401